



# **Jackson, Missouri Collaboration & Informational Meeting**



# Jackson, Missouri Informational Meeting

## Why we are here:

- Information sharing & Importance of communication (transparency)
- 2014 NATA: National Air Toxics Assessment
- Collaboration - EPA, MDNR, Facilities
- Accomplishments & work completed

# Air Emissions & Role of EPA

- First, EPA provides oversight to the states since many states are directly delegated the authority to implement the Clean Air Act.
  - In the case of Missouri, the Department of Natural Resources is the state agency responsible for ensuring the Clean Air Act is implemented and holds the legal authority to do several things:
    - Require stationary sources of air pollution to get air permits and report their emissions and
    - Evaluate the types and amounts of emissions reported by an air pollution source.
- Second, EPA provides technical support.



# **NATA**

## **National Air Toxics Assessment**

**What is NATA?**



# NATA

## National Air Toxics Assessment

- NATA is a screening tool (National scale)
- Ongoing review of **Air Toxics** or **Hazardous Air Pollutants** (HAPS) (Every 3 years)
- NATA provides broad estimates of the risk of developing cancer and noncancer health effects from about 180 Clean Air Act air toxics
- Used to help identify areas that may have higher risk to public health and a need for further study...
  - review emission estimates/calculations
  - review data and parameter assumptions
  - refined emissions modeling...to better understand local risks.



# NATA

## National Air Toxics Assessment

### NATA Limitations:

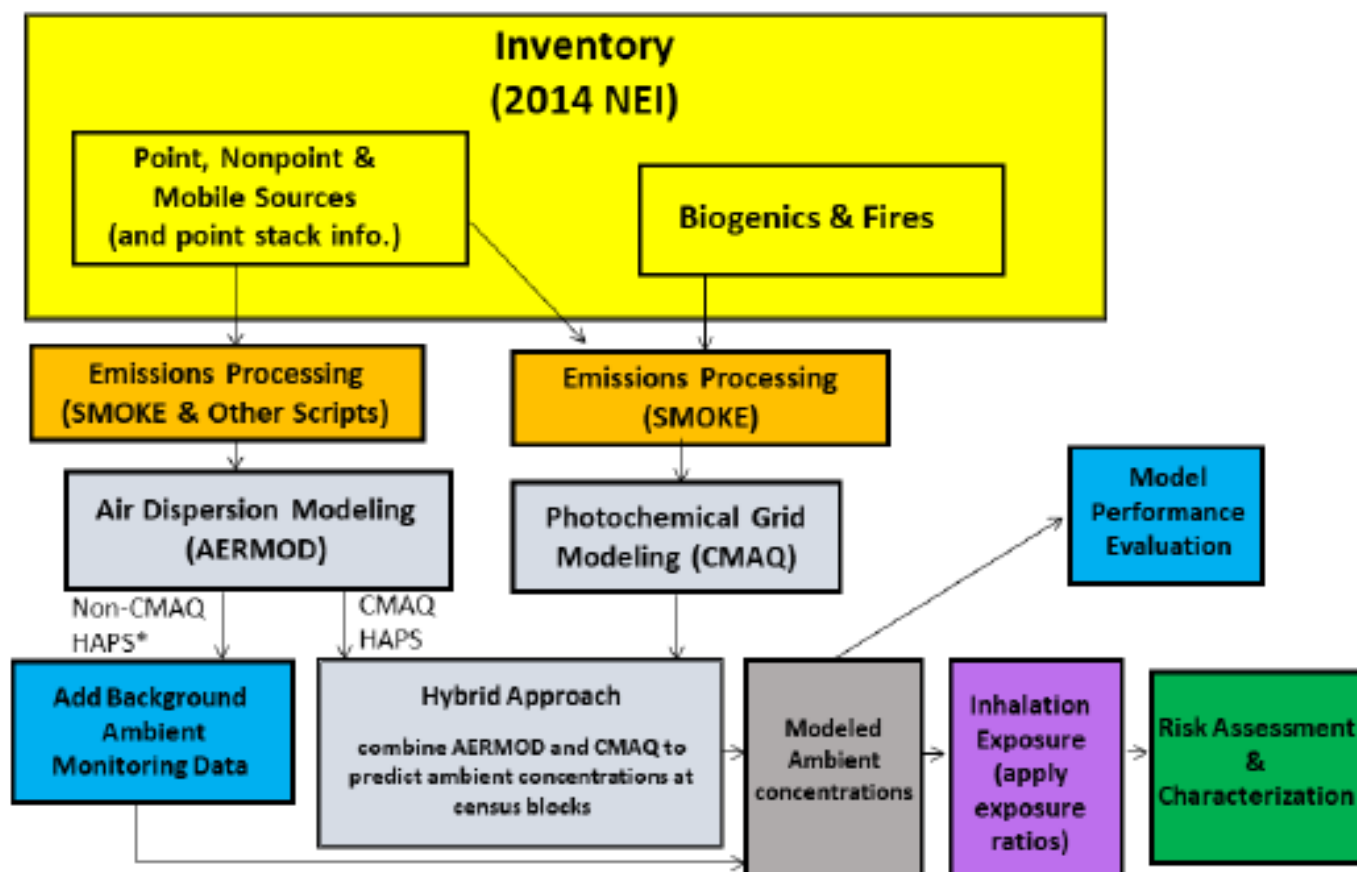
- Only used to identify areas for further review  
(SCREENING TOOL)
- Not used to compare risks at local levels (such as between neighborhoods)
- Should not be used to examine trends from one NATA year to another or state to state
- Quantify benefits of reduced air toxics emissions



# NATA

## National Air Toxics Assessment

Figure 1-2 provides a more detailed flowchart showing the emissions sources used in the air quality models and how the hybrid approach fits into the overall approach.



\*Includes all HAPs in AK/HI/PR/VI since not part of CMAQ modelling domain

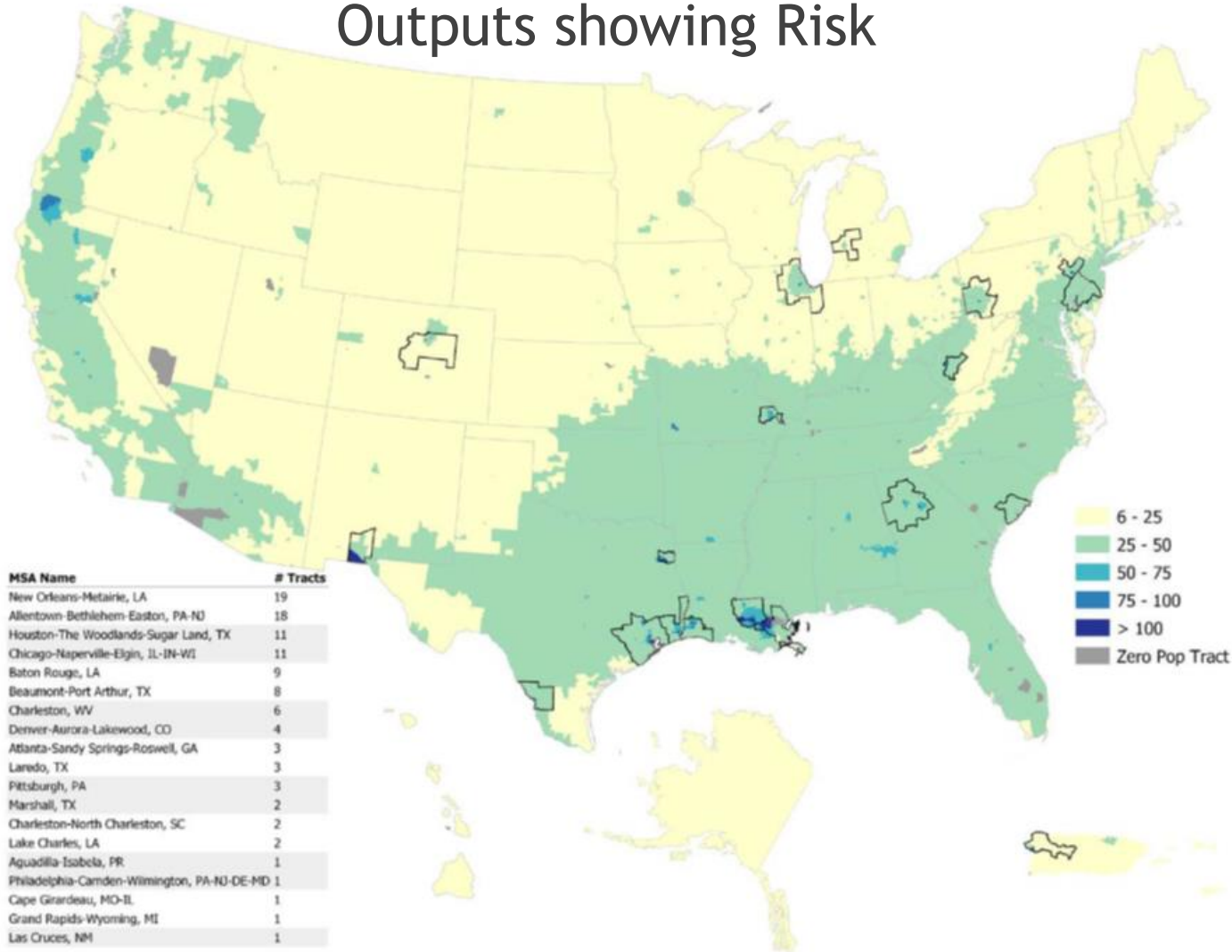
Figure 1-2. Detailed steps and approach used for 2014 NATA



# NATA

## National Air Toxics Assessment

### Outputs showing Risk





# What is Risk?

- **Risk** is the chance that a stressor will cause harm to human health or the environment
- **Risk assessment** is a process to characterize the nature and magnitude of health risks to humans  
example: National Air Toxics Assessment(NATA)
- Most EPA program decisions and regulatory limits are risk-based



# Risk Assessment

- **Risk** = Toxicity x Exposure
- **Risk** is dependent on Toxicity and Exposure

Toxicity- the inherent ability of a chemical to do harm

Exposure- amount of chemical that an individual contacts (time)



# Interpreting Cancer Risks

## “Excess Individual Lifetime Cancer Risks”

*(Above & beyond existing risk)*

- **“Excess”** - above background cancer rates of (1:2 for men) or (1:3 for women)
- **“Individual”** - to an individual
- **“Lifetime”** - the excess risk over a lifetime (70 yrs)
- **“Risk”** - probability or chance of cancer



# Interpreting Cancer Risks

## Quantifying excess individual lifetime cancer risk

- Cancer risk is expressed as a probability  
(100 in 1,000,000) or (1 in 10,000)
- For every 10,000 people exposed, one extra case may occur.
- EPA uses 100 in 1,000,000 as an indicator



# Uncertainties in Risk Assessment

Lack of data and/or scientific uncertainty necessitate use of assumptions and science policy in risk assessment

Public health agencies generally use assumptions and policies that will **not** underestimate health risk (conservative).

# What is Ethylene Oxide?

**Ethylene Oxide?**

# Hazardous Air Pollutants (HAPs)

- ▶ Created in the Clean Air Act (CAA)
- ▶ May cause cancer, birth defects, respiratory illness or other adverse ecological effects
- ▶ Currently 187 different chemicals or chemical groups
  - ▶ Benzene, Formaldehyde, Perchloroethylene, Lead, Hydrochloric Acid, etc.
- ▶ Regulated under Section 112 of the CAA
  - ▶ Ethylene Oxide is one of the 187 chemicals listed

# Ethylene Oxide Properties

- ▶ EtO is a gas at room temperature
- ▶ Colorless and flammable gas with likely no odor outdoors
  - ▶ Odor concentration threshold for ethylene oxide is much higher than we would expect in ambient air
- ▶ There are two key uses for ethylene oxide:
  - ▶ It is used to make other chemicals in everyday products, such as ethylene glycol (anti-freeze), plastics, PVC pipe and cosmetics
  - ▶ Sterilization of medical and dental devices that can't be sterilized other ways

# Ethylene Oxide - Revised Cancer Risk 2016

- ▶ In 2016, EPA updated the risk value for Ethylene Oxide.
- ▶ Newer Studies on Risk to Human Health
- ▶ Increased risk of non-Hodgkin lymphoma, myeloma, and lymphocytic leukemia and breast cancer in women.
- ▶ 2014 NATA shows most areas with elevated risks driven by ethylene oxide compared to previous NATA releases. (2005, 2008, 2011)
- ▶ Higher risk now does not mean there is more of this compound in the air in these places than before
- ▶ Even if emissions in an area are the same or lower—the new cancer risk value often results in a higher risk estimate.

# EPA Response on Ethylene Oxide

## EPA Moves Forward on Suite of Actions to Address Ethylene Oxide

- ▶ 2 pronged approach:

### Prong 1: Rulemaking:

- ▶ Miscellaneous Organic NESHAP (MON)- proposed
- ▶ ETO Sterilizer NESHAP -TBD

### Prong 2: State and local air agencies - MDNR

- ▶ Information gathering
- ▶ Community engagement

# EPA Response Missouri

## Prong 2: State and Local Air Agencies - MDNR

- ▶ Identify sources of ETO emissions in Missouri
- ▶ Verify emissions and modeling characteristics
- ▶ Identify opportunities for emissions/risk reductions

# Midwest Sterilization, MDNR and EPA Region 7 NATA Response

- ▶ Identified Midwest Sterilization in NATA as a source of Ethylene Oxide
- ▶ EPA Inspection - May 2018 -Full Compliance
- ▶ Multiple meetings and phone calls with Midwest, EPA and MDNR
- ▶ EPA provided technical guidance on risk modeling and emission control scenarios
- ▶ Midwest voluntarily committed to purchase and install new control device to reduce emissions below what is currently required.

# Midwest Sterilization, MDNR and EPA Region 7 NATA Response- Continued - **ALTERNATE**

- ▶ Installation of New West Acid Scrubber to reduce Ethylene Oxide Emissions from Back Vents 99.5 and Existing Scrubber 99.999% - September 2019
- ▶ Midwest has further voluntarily committed to reduce emissions from aeration room controls by at least an additional 50% - 2020
- ▶ Midwest is exploring an additional polishing scrubber that could reduce emissions even further.
- ▶ Total ethylene oxide emissions would be reduced by approximately 87% with all these controls.
- ▶ Modelled cancer risk reduced at every receptor in Jackson census tract.
- ▶ Before new controls - maximum modelled risk - 1178/million, >80 receptors above 100 in million
- ▶ Post new controls - maximum modelled risk - 200/million, 1 receptor above 100 in million

# Midwest Sterilization, MDNR and EPA Region 7 NATA Response-Continued

- ▶ Installation of new wet acid scrubber to reduce ethylene oxide emissions from back vents and existing scrubber by 99.5% - September 2019
- ▶ Midwest has further voluntarily committed to reduce emissions from aeration room controls by another 50% - 2020
- ▶ Total ethylene oxide emissions would be reduced by Approximately 87% with all these controls.

# Midwest Sterilization Ethylene Oxide Emissions (lbs)

	Aeration Rooms	Sterilization Chamber	Back Vents	Fugitives	Total
2014 Baseline	1,000	1,157	3,609	190	5,767
Scrubber Project	1,000	5.8	18	190	1,213.8
Safe Cell Project	500	5.8	18	190	713.8

# Next Steps

- ▶ Continue to work with MDNR and Midwest to verify emission reductions.
- ▶ Look for further potential emissions/risk reductions.
- ▶ Answer questions for Jackson Community.

**Questions?**